CLAIMS

What is claimed is:

1. A method for treating a lower urinary tract disorder, which comprises administering to an individual in need thereof a therapeutically effective amount of an active agent wherein said agent is a Cav2.2 subunit calcium channel modulator or a pharmaceutically acceptable salt, ester, amide, prodrug, active metabolite or derivative thereof.

2. The method of claim 1, wherein the lower urinary tract disorder is selected from the group consisting of overactive bladder, prostatitis, prostadynia, interstitial cystitis, benign prostatic hyperplasia, and spastic bladder.

3. The method of claim 1, wherein the active agent is contained within a pharmaceutical formulation.

4. The method of claim 3, wherein the pharmaceutical formulation is a unit dosage formulation.

5. The method of claim 1, wherein the active agent is administered on an as-needed basis.

6. The method of claim 1, wherein the active agent is administered prior to commencement of an activity wherein suppression of the symptoms of a lower urinary tract disorder would be desirable.

7. The method of claim 6, wherein the active agent is administered from about 0 to about 3 hours prior to commencement of an activity wherein suppression of said symptoms would be desirable.

8. The method of claim 3, wherein the formulation is a controlled release dosage formulation.

9. The method of claim 8, wherein the formulation is a delayed release dosage formulation.

10. The method of claim 8, wherein the formulation is a sustained release dosage formulation.

11. The method of claim 9, wherein the formulation is a sustained release dosage formulation.

12. The method of claim 10, wherein the sustained release dosage formulation provides drug release over a time period of from about 6 hours to about 8 hours.

13. The method of claim 1, wherein the active agent is administered orally.

14. The method of claim 3, wherein the active agent is administered orally.

15. The method of claim 14, wherein the pharmaceutical formulation is selected from the group consisting of tablets, capsules, caplets, solutions, suspensions, syrups, granules, beads, powders and pellets.

16. The method of claim 1, wherein the active agent is administered transmucosally.

17. The method of claim 16, wherein the active agent is administered sublingually.

18. The method of claim 16, wherein the active agent is administered buccally.

19. The method of claim 16, wherein the active agent is administered intranasally.

20. The method of claim 16, wherein the active agent is administered transurethrally.

21. The method of claim 16, wherein the active agent is administered rectally.

22. The method of claim 16, wherein the active agent is administered by inhalation.

23. The method of claim 1, wherein the active agent is administered topically.

24. The method of claim 1, wherein the active agent is administered transdermally.

25. The method of claim 1, wherein the active agent is administered parenterally.

26. The method of claim 1, wherein the active agent is administered intrathecally.

27. The method of claim 1, wherein the active agent is administered by a route of administration selected from the group consisting of: vaginally and perivaginally.

28. The method of claims 27, wherein the formulation is selected from the group consisting of vaginal suppositories, creams, ointments, liquid formulations, pessaries, tampons, gels, pastes, foams and sprays.

29. The method of claim 1, wherein the lower urinary tract disorder is a painful lower urinary tract disorder.

30. The method of claim 1, wherein the lower urinary tract disorder is a non-painful lower urinary tract disorder.

31. The method of claim 30, wherein the non-painful lower urinary tract disorder is non-painful overactive bladder.

32. The method of claim 3, wherein the lower urinary tract disorder is selected from the group consisting of overactive bladder, prostatitis, prostadynia, interstitial cystitis, benign prostatic hyperplasia, and spastic bladder.

33. The method of claim 1, wherein said Cav2.2 subunit calcium channel modulator is selected from the group consisting of:

a. ω-conotoxin GVIA or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;
b. ω-conotoxin MVIIA or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;
c. Synthetic ω-conotoxin MVIIA or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;
d. ω-conotoxin CNVIIA or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;
e. ω-conotoxin CVIID or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;
f. ω-conotoxin AM336 or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;
g. Cilnidipine or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;
h. Amlodipine or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

i. L-cysteine derivative 2A or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

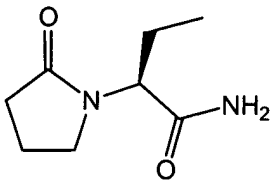
j. ω-agatoxin IVA or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

k. N,N-dialkyl-dipeptidylamines or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

l. Levetiracetam or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

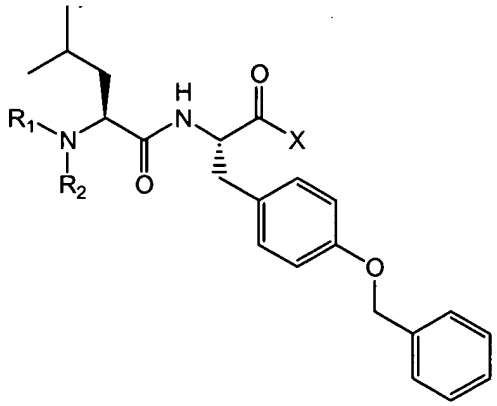
m. Ziconotide or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

n. (S)-alpha-ethyl-2-oxo-1-pyrrolidineacetamide according to the following structure,

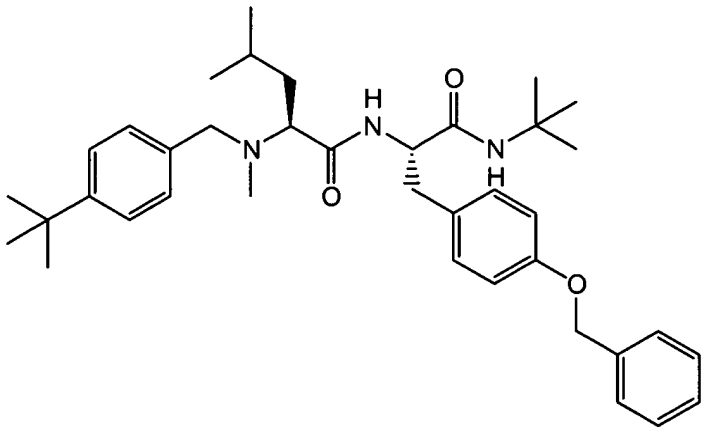


or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

o. A substituted peptidylamine according to the following structure,

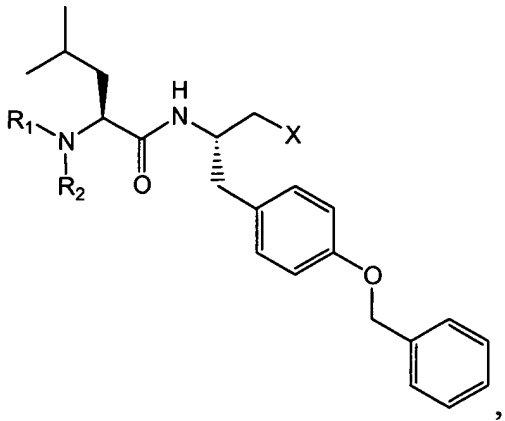


wherein X is selected selected from the group consisting of OR, NR_1R_2, and $COOR_1$, and R_1 and R_2 are selected from the group consisting of hydrogen, and C_1-C_8 alkyl, aryl and heteroaryl optimally substituted with one to three substituents, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;



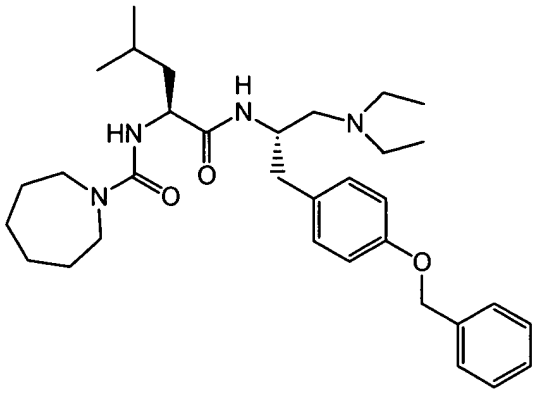
or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

p. A reduced dipeptide analogue according to the following structure,



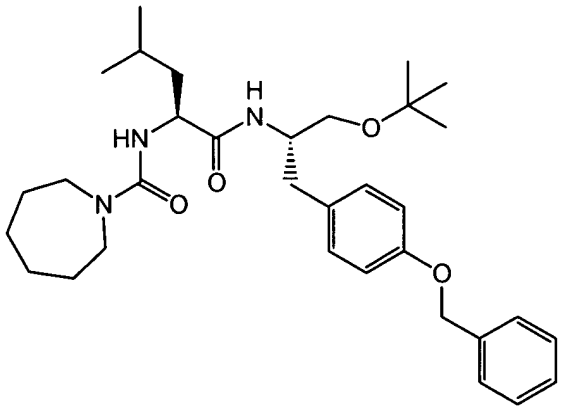
wherein X is selected from the group consisting of OR, NR_1R_2, and $COOR_1$, and R_1 and R_2 are selected from the group consisting of hydrogen and C_1-C_8 alkyl, aryl, and heteroaryl optimally substituted with one to three substituents, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

q. A compound according to the following structure,



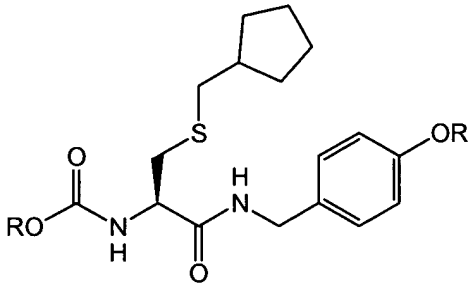
or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

r. A compound according to the following structure,



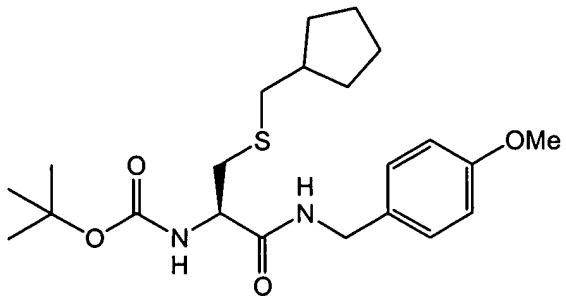
or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

s. An amino acid derivative according to the following structure,



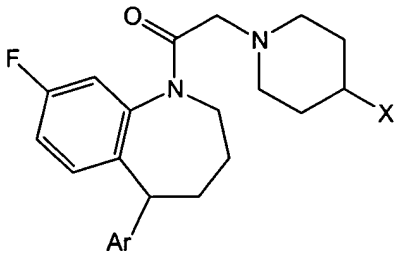
wherein R is selected from the group consisting of hydrogen and C_1-C_6 alkyl, aryl, and heteroaryl optionally substituted with one to three substituents, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

t. A compound according to the following structure,



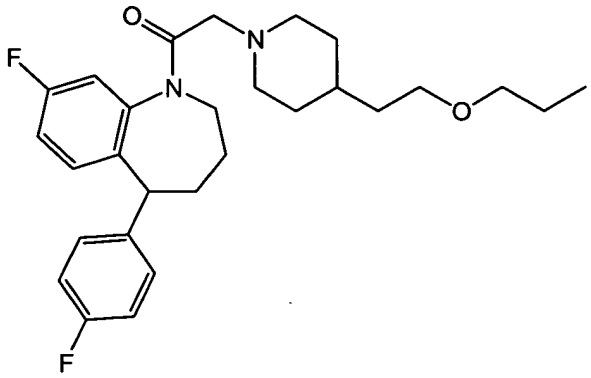
or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

u. A benzazepine derivative according to the following structure,



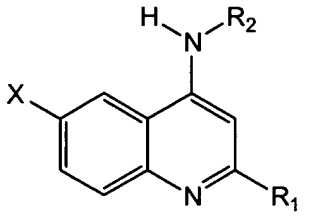
wherein Ar is selected from the group consisting of aryl and heteroaryl optimally substituted with one to three substituents, and X is selected from the group consisting of hydrogen and C_1-C_6 alkyl and alkoxy, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

v. A compound according to the following structure,



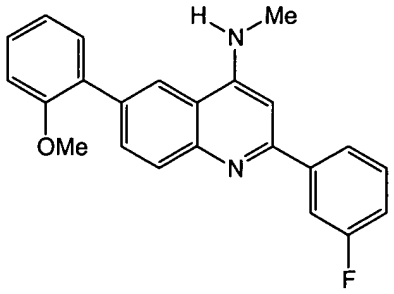
or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

w. A compound according to the following structure,



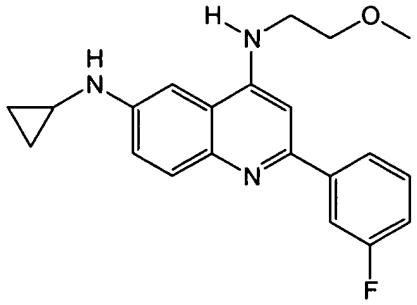
wherein X is selected from the group consisting of R_1 and NHR_1, R_1 is selected from the group consisting of hydrogen and C_1-C_6 alkyl, aryl, and heteroaryl optimally substituted with one to three substituents, and R_2 is C_1-C_4 alkyl or alkoxy, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

x. A compound according to the following structure,



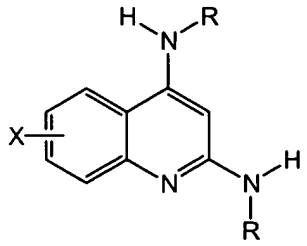
or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

y. A compound according to the following structure,



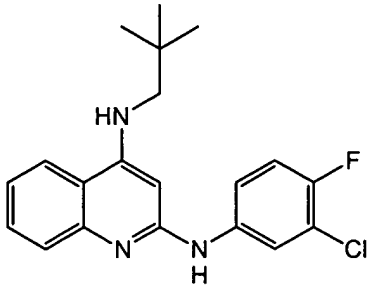
or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

z. A compound according to the following structure,



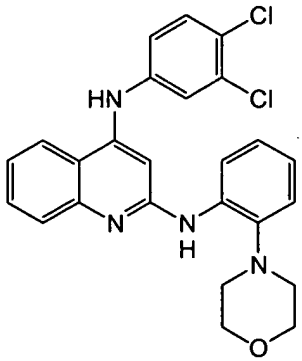
wherein X is selected from the group consisting of hydrogen and halogen, and R is selected from the group consisting of C_1-C_6 alkyl, aryl, and heteroaryl optimally substituted with one to three substituents, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

aa. A compound according to the following structure,



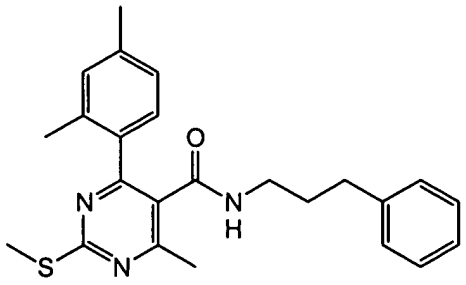
or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

bb. A compound according to the following structure;



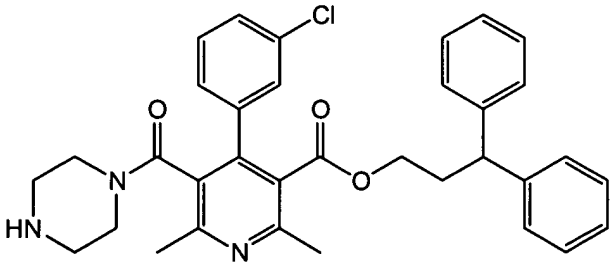
or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

cc. A compound according to the following structure,



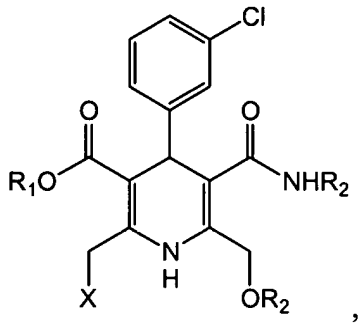
or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

dd. A compound according to the following structure,



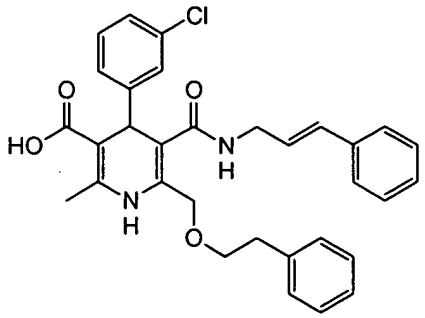
or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

ee. A dihydropyridine derivative according to the following structure,



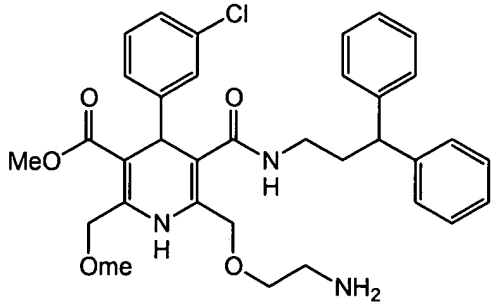
wherein X is selected from the group consisting of hydrogen and C_1-C_4 alkyl and alkoxy, R_1 is selected from the group consisting of hydrogen and C_1-C_4 alkyl, and R_2 is selected from the group consisting of C_1-C_6 alkyl, alkoxy, alkylamino, and aryl-substituted alkyl, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

ff. A compound according to the following structure,



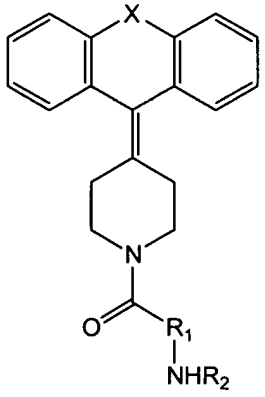
or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

gg. A compound according to the following structure,



or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

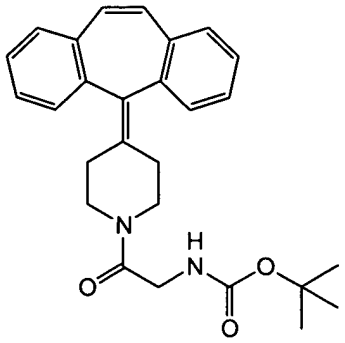
hh. A diarylalkene or diarylalkane derivative according to the following structure,



wherein X is selected from the group consisting of CHCH, CH_2CH_2, CH_2-Y, O, and S, Y is selected from the group consisting of O and S, R_1 is selected from the group consisting of C_1-C_4 alkyl and alkoxy, and R_2 is selected from the group consisting of hydrogen, $COOR_1$, and C_1-C_4 alkyl

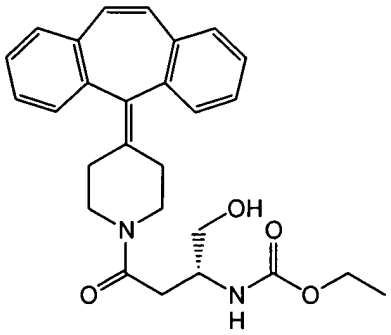
and alkoxy, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

ii. A compound according to the following structure,



or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof; and

jj. A compound according to the following structure,



or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof.

34. The method of claim 1, wherein the individual in need thereof is an individual suffering from a spinal cord injury.

35. The method of claim 34, wherein the lower urinary tract disorder is spastic bladder.

36. The method of claim 3, wherein the pharmaceutical formulation further comprises an additional active agent.

37. The method of claim 36, wherein the additional active agent is selected from the group consisting of:

a. ω-conotoxin GVIA or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

b. ω-conotoxin MVIIA or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

c. ω-conotoxin CNVIIA or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

d. ω-conotoxin CVIID or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

e. ω-conotoxin AM336 or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

f. Cilnidipine or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

g. Amlodipine or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

h. L-cysteine derivative 2A or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

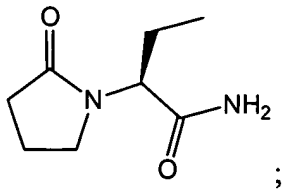
i. ω-agatoxin IVA or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

j. N,N-dialkyl-dipeptidylamines or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

k. Levetiracetam or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

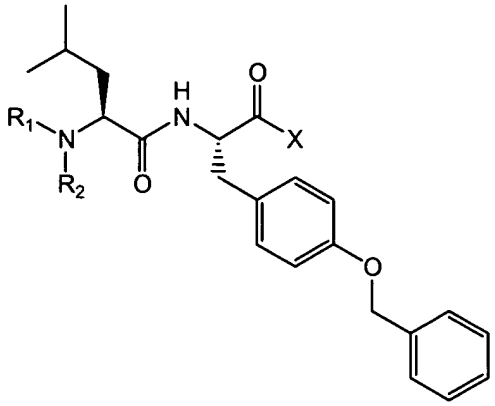
l. Ziconotide or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof;

m. (S)-alpha-ethyl-2-oxo-1-pyrrolidineacetamide according to the following structure, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative, thereof



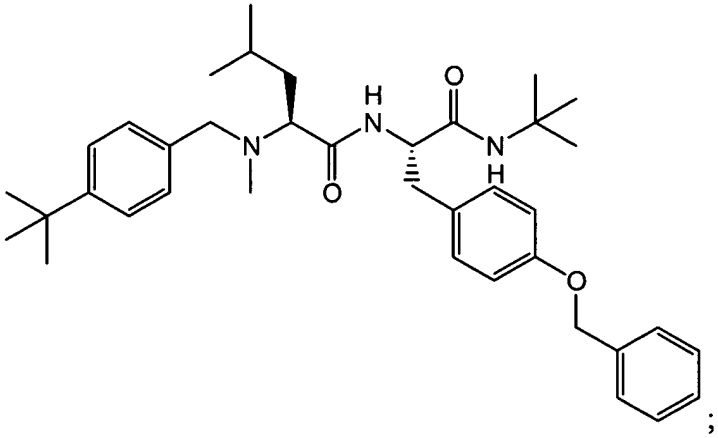
;

n. Substituted peptidylamines according to the following structure, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative, thereof,



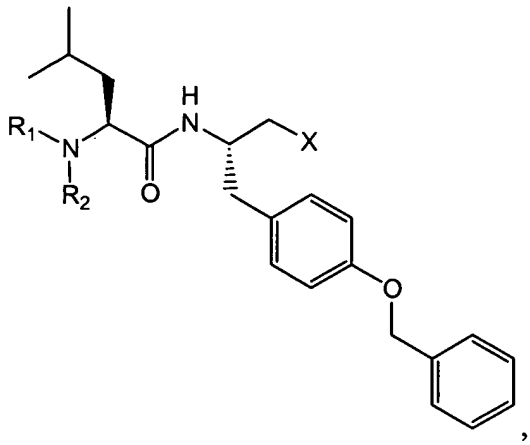
wherein X is selected from the group consisting of OR, NR_1R_2, and $COOR_1$, and R_1 and R_2 are selected from the group consisting of hydrogen and C_1-C_8 alkyl, aryl, and heteroaryl optimally substituted with one to three substituents;

o. A compound according to the following structure, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative, thereof



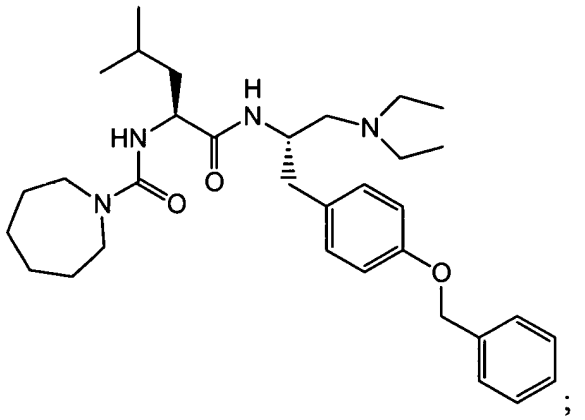
;

p. Reduced dipeptide analogues according to the following structure, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative, thereof,

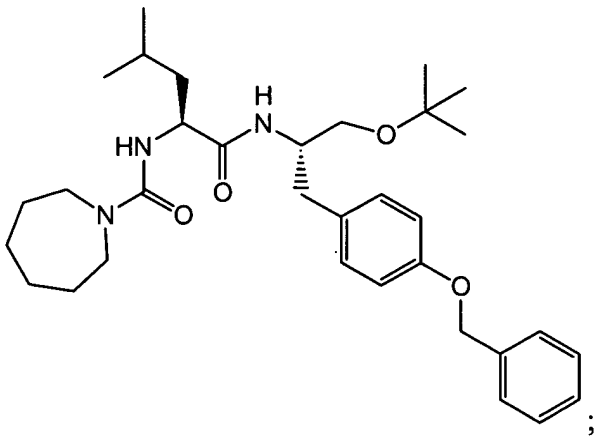


wherein X is selected from the group consisting of OR, NR_1R_2, and $COOR_1$, and R_1 and R_2 are selected from the group consisting of hydrogen and C_1-C_8 alkyl, aryl, and heteroaryl optimally substituted with one to three substituents;

q. A compound according to the following structure, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof,

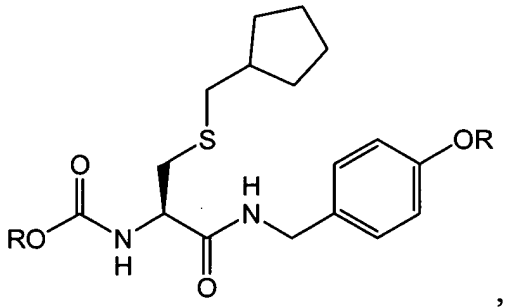


r. A compound according to the following structure, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof,



;

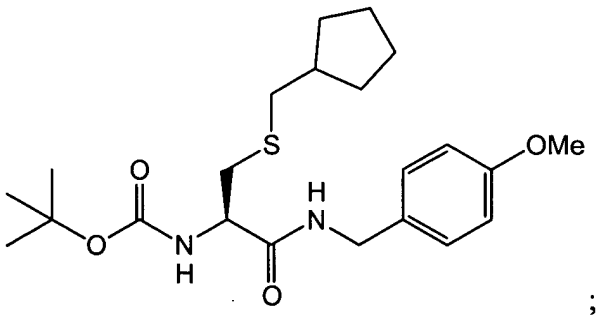
s. Amino acid derivatives according to the following structure, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative, thereof,



,

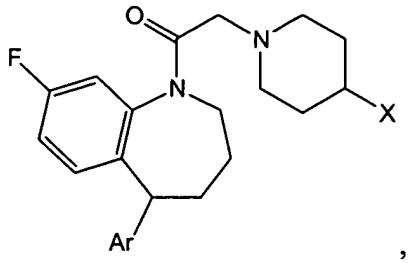
wherein R is selected from the group consisting of hydrogen and C_1-C_6 alkyl, aryl, and heteroaryl optimally substituted with one to three substituents;

t. A compound according to the following structure, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof,



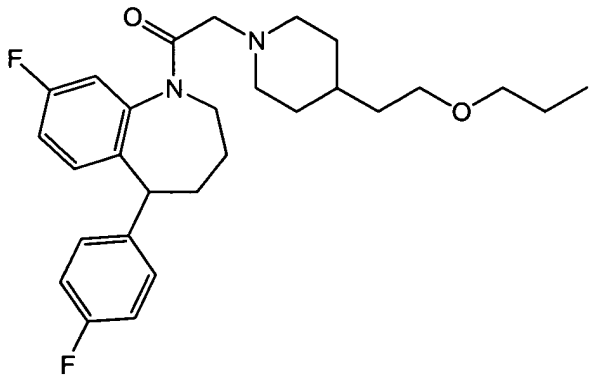
;

u. Benzazepine derivatives according to the following structure, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative, thereof,



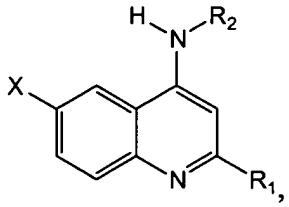
wherein Ar is selected from the group consisting of aryl and heteroaryl optimally substituted with one to three substituents, and X is selected from the group consisting of hydrogen and C_1-C_6 alkyl and alkoxy;

v. A compound according to the following structure, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof,



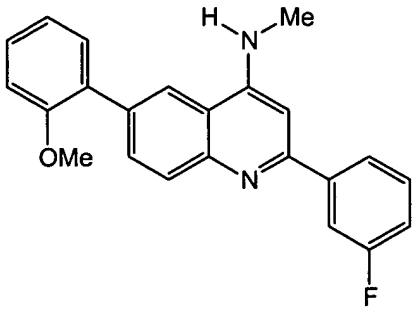
;

w. Compounds according to the following structure, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative, thereof,



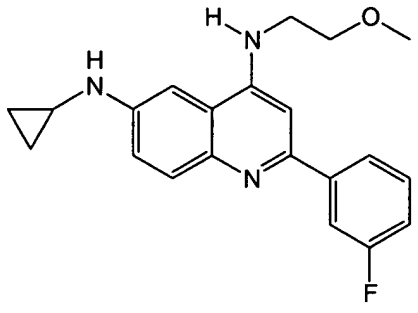
wherein X is selected from the group consisting of R_1 and NHR_1, R_1 is selected from the group consisting of hydrogen and C_1-C_6 alkyl, aryl, and heteroaryl optimally substituted with one to three substituents, and R_2 is C_1-C_4 alkyl or alkoxy;

x. A compound according to the following structure, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof,



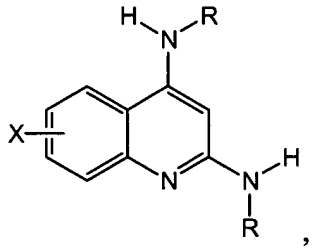
;

y. A compound according to the following structure, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof,



;

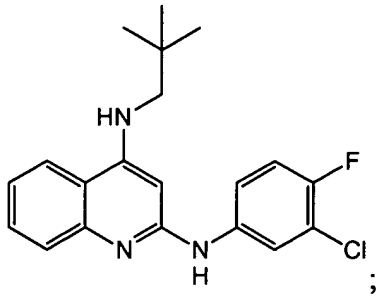
z. Compounds according to the following structure, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative, thereof,



,

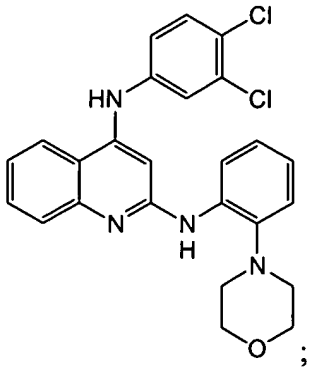
wherein X is selected from the group consisting of hydrogen and halogen, and R is selected from the group consisting of C_1-C_6 alkyl, aryl, and heteroaryl optimally substituted with one to three substituents;

aa. A compound according to the following structure, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof,



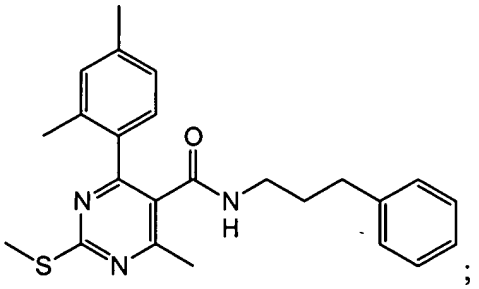
;

bb. A compound according to the following structure, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof,



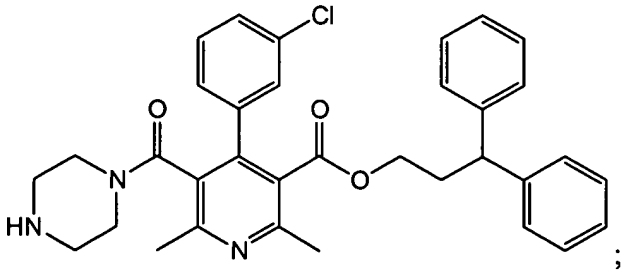
;

cc. A compound according to the following structure, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative, thereof,



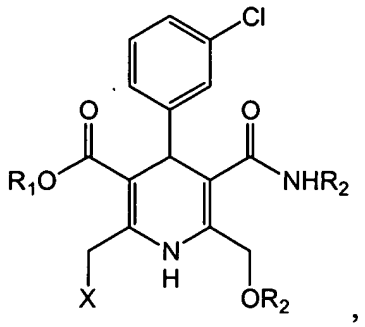
;

dd. A compound according to the following structure, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative, thereof



;

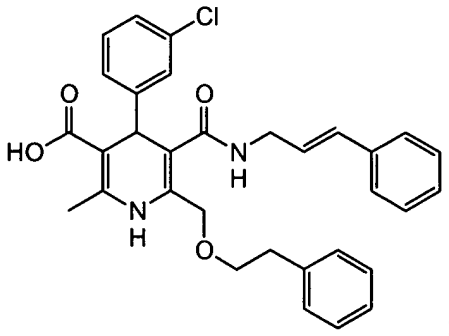
ee. Dihydropyridine derivatives according to the following structure, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative, thereof,



,

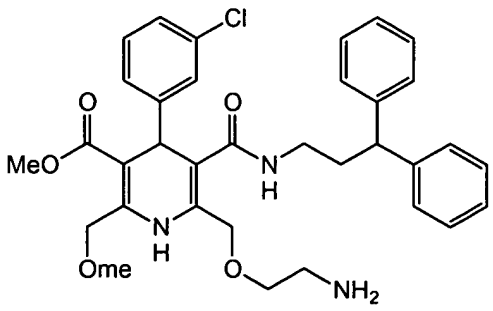
wherein X is selected from the group consisting of hydrogen and C_1-C_4 alkyl and alkoxy, R_1 is selected from the group consisting of hydrogen and C_1-C_4 alkyl, and R_2 is selected from the group consisting of C_1-C_6 alkyl, alkoxy, alkylamino, and aryl-substituted alkyl;

ff. A compound according to the following structure, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof,



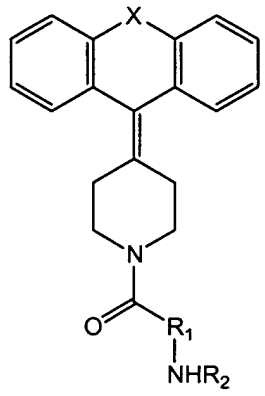
;

gg. A compound according to the following structure, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof,



;

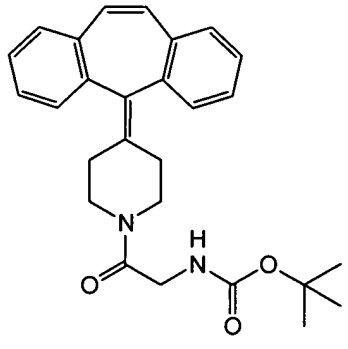
hh. Diarylalkene and diarylalkane derivatives according to the following structure, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative, thereof,



,

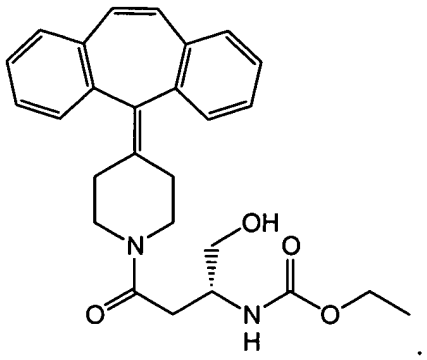
wherein X is selected from the group consisting of CHCH, CH_2CH_2, CH_2-Y, O, and S, Y is selected from the group consisting of O and S, R_1 is selected from the group consisting of C_1-C_4 alkyl and alkoxy, and R_2 is selected from the group consisting of hydrogen, $COOR_1$, and C_1-C_4 alkyl and alkoxy;

ii. A compound according to the following structure, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof,



; and

jj. A compound according to the following structure, or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof,



38. A method for treating overactive bladder, which comprises administering to an individual in need thereof a therapeutically effective amount of an active agent wherein said agent is a Cav2.2 subunit calcium channel modulator or a salt, enantiomer, analog, ester, amide, prodrug, active metabolite, or derivative thereof.

39. A pharmaceutical formulation for treating overactive bladder and adapted for transmucosal drug administration, comprising a therapeutically effective amount of a Cav2.2 subunit calcium channel modulator, or a pharmaceutically acceptable salt, ester, amide, prodrug, active metabolite, or derivative thereof, and a carrier suitable for transmucosal drug delivery buccally, sublingually, intranasally, rectally, or by inhalation.

40. A packaged kit for a patient to use in the treatment of overactive bladder, comprising: a pharmaceutical formulation of a Cav2.2 subunit calcium channel modulator; a container housing the pharmaceutical formulation during storage and prior to administration; and instructions for carrying out drug administration in a manner effective to treat overactive bladder.